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with Some Remarks on the Technique
of the Operation.*

BY

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NOTES ON SIX CASES OF PERINEAL SECTION; WITH SOME
REMARKS ON THE TECHNIQUE OF THE OPERATION.¹

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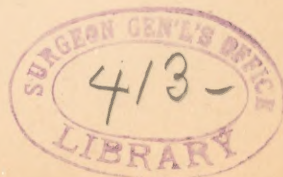
PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
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THERE has always been more or less confusion in the nomenclature of the perineal operations for the relief of stricture. The old *boutonnaire* operation (of which the so-called "Cock's operation" is a modification) had for its object the opening of the urethra behind the obstruction, was purely palliative, and if it ever effected a cure did so by accident, as the procedure itself did not include of necessity any division or enlargement of the strictured portion of the canal. It is an "external urethrotomy," to be sure, but it is not related either in its purpose or its method to the other operations known by that name.

Since Syme revived and popularized the formal operation of external urethrotomy—the division of a stricture upon a grooved staff passed through it into the bladder—more system has been introduced into the terms employed, but there is still much objectionable looseness. Hunter, Grainger, C. Bell, and others had, before Syme's time, formulated the operation known as "perineal section," which was also an external urethrotomy, but which was then restricted to those cases in which no instrument whatever could be made to pass the stricture. The term should still be reserved for such cases, and on account of its brevity is, perhaps, preferable to its synonym, "external perineal urethrotomy without a guide."

The cases which follow belong exclusively in this category—*i. e.*, are all cases of perineal section, and do not include any cases of external perineal urethrotomy. They were all performed during acute retention of urine, which resulted in two from recent complete rupture of the urethra; in two from traumatic stricture following old and presumably incomplete rupture; in one from very old neglected strictures and recent false passage; in one from stricture and false passages, both of many years' duration. Such cases are so frequent in the practice of every hospital surgeon that I shall summarize them as briefly as possible, my object in reporting them being chiefly to call attention to certain details of the operation, and to invite discussion upon them.

¹ Read before the American Association of Genito-urinary Surgeons, 1890.



CASE I.—E. C., æt. forty-four. Cause and duration of obstruction: five attacks of gonorrhœa twenty years ago. Urinary symptoms for fifteen years.

Condition when first seen: Urinating in drops every fifteen or twenty minutes, with tenesmus. Bladder distended; free bleeding from recent attempt at catheterization. False passage, beginning just anterior to the triangular ligament and running between prostate and rectum. No instrument could be passed.

Date of operation: October 30, 1889.

Details of operation: False passage filled with filiform bougies. Syme's staff passed down to membranous urethra. Perineum opened on point of staff. Urethral walls held asunder by silk threads. Clots turned out from false passage. Firm fibrous stricture, easily recognized. No probe would pass through it. Urethra posterior to it, dilated to the size of the thumb, was opened and flat grooved director was passed into the bladder. The stricture was freely divided; a large-sized Nélaton catheter was passed through whole length of urethra into bladder and left *in situ*. An attempt at suturing the urethra failed, on account of lack of material at seat of stricture. Wound packed with iodoform gauze. No serious difficulty met with.

Time of operation: Thirty-five minutes.

Subsequent course of case: Uninterrupted recovery. Catheter removed in six days. Regular catheterization every four hours begun on the fifteenth day. Wound healed entirely on the thirty-seventh day.

Calibre of urethra at date of discharge: Patient passes No. 31 French sound easily.

CASE II.—W. K., æt. fifty-five. Cause and duration of obstruction: Gonorrhœa in 1862 and 1863. Urgent urinary symptoms for six months.

Condition when first seen: Absolute retention. Bladder up to umbilicus; perineum and scrotum distended with urine, brawny and discolored. Moderate degree of shock. No instrument could be passed.

Date of operation: November 17, 1889.

Details of operation: Syme's staff introduced and cut down upon. Perineum filled with old plastic lymph, partially organized and of almost cartilaginous density. Urethra almost obliterated for three-quarters of an inch posterior to the bulb. Field of operation obscured by extremely free oozing from dilated vessels, which, imbedded in the lymph, seemed to be kept patulous. Urethra finally found near apex of prostate; flat director passed into bladder.

Tissues in course of urethra which could not be recognized as a distinct canal between the bulb and the prostate were freely divided; Nélaton catheter No. 26 French was passed and tied in.

No attempt at suture was made. Wound packed with iodoform-gauze.

Time of operation: Seventy minutes.

Subsequent course of case: Tedious convalescence, on account of condition of perineal tissues. Catheter removed in fourteen days. Catheterization begun in twenty-four days. Wound closed on forty-eighth day.

Calibre of urethra at date of discharge: Patient passes 32 French easily.

CASE III.—J. B., æt. thirteen. Cause and duration of obstruction: Rupture of urethra from fall astride the sharp edge of an upturned empty barrel nine years previous.

Condition when first seen: Very frequent urination. Only partial evacuation of bladder. Some straining. Urine loaded with pus; a few granular and hyaline casts. Patient pallid and emaciated. No instrument could be passed.

Details of operation: Urethra opened on Syme's staff. A long and tedious dissection failed to disclose opening of stricture. Canal opened at base of prostate. Intervening tissues divided. Nélaton No. 15 French left in bladder. Wound packed. No suture.

Time of operation: ninety minutes.

Subsequent course of case: On the seventh day had orchitis of right side; at end of second week had rigor, followed by fever. Subsequently had frequent attacks of pyrexia, with exceedingly high alternating with subnormal temperatures. Urine loaded with pus. Pain over left kidney. No relief from any form of treatment. Diagnosis: Pyelitis. Exploratory nephrotomy recommended, but refused by parents. Patient passed from notice with small perineal fistula still discharging.

Calibre of urethra at date of discharge: No. 15 French passed easily.

CASE IV.—L. N., æt. forty. Cause and duration of obstruction: Fell astride of an iron girder twenty-four hours previous.

Condition when first seen: Absolute retention; great distention of bladder; free bleeding from meatus; perineum and scrotum swollen and infiltrated. No instrument could be passed.

Details of operation: Median section of perineum. Large quantities of blood and urine escaped. Scrotum incised with same result. Catheter passed through meatus protrudes into wound, and a complete rupture of the urethra is found extending through the so-called bulbous portion—the posterior part of the spongy portion.

A long search for the posterior portion failed to find it, until by pressure upon the pubes a jet of urine was made to appear in the wound, and led to the discovery of the proximal end twisted upon itself, retracted, and resembling the end of a large artery which had undergone torsion. A director was first passed through it into the bladder. Then an English gum catheter was passed for the whole length of the urethra. It was found, by moderate traction, that the two ends could be brought into contact. They were then united by six interrupted sutures of very fine chromicized gut, which resists absorption for two or three weeks. The sutures were passed through the entire thickness of the urethra. A large rubber drainage-tube was then laid in the wound, the inner end of the tube opposite the point of junction. The angles of the perineal wound were then united by deep silver sutures, and the centre gently packed around the drainage-tube.

Time of operation: One hundred and twenty minutes.

Subsequent course of case: No fever; no pain. Urine possibly appeared through perineal wound for three days, but in such small quantity that it was uncertain. None later than that. Catheter removed on ninth day, but passed gently every four hours. Drainage-tube removed on twelfth day. Perineal wound healed solid on twentieth day. Patient urinated in a full stream at this time. Went home on twenty-fifth day.

Calibre of urethra at date of discharge: Passing No. 30 steel sound easily and painlessly for himself.

CASE V.—J. W., aged seventeen. Cause and duration of obstruction: Climbing from the roof of an out-house fell astride a fence thirty-three hours previously.

Condition when first seen: Retention. Urethrorrhagia. Bladder abnormal. Perineum distended. No instrument could be passed.

Details of operation: Median incision. Complete rupture of membranous urethra; posterior portion of urethra promptly found by bimanual pressure, one hand on the hypogastrium with fingers of the other in the rectum. A portion of bruised proximal end cut off with scissors to obtain good material for sutures; five chromicized gut sutures passed so as to unite urethra over an English gum catheter No. 20. Drainage-tube laid in wound, which was united at angles and packed in centre with iodoform-gauze.

Time of operation: Forty minutes.

Subsequent course of case: No fever. No pain. No appearance of urine in wound. Catheter removed on the fifth day on account of vesical irritation. The next day a few drops of urine came through the perineal wound. Catheter was used every four hours. No further leakage occurred. Drainage-tube was removed on ninth day. Wound healed solidly in two weeks, patient urinating freely and painlessly on the seventeenth day. Went home in three weeks.

Calibre of urethra at date of discharge: Passing No. 22 steel sound easily.

CASE VI.—P. M., aged thirty-three. Cause and duration of obstruction: August, 1889, fell into a trench fourteen feet deep, alighting astride a plank. Had symptoms of incomplete rupture of the urethra. Retention relieved by catheterization. In October retention again and formation of extensive false passage during attempted catheterization.

Condition when first seen: Retention. Passing large quantities of blood from the meatus in the form of clots. Bladder much distended. Shocked. No instrument could be passed.

Details of operation: Median incision on Syme's staff passed down to obstruction. Enormous quantity of clot turned out of perineum. Bimanual pressure caused the protrusion of a clot from a portion of the urethra back of the seat of the original injury, which was near the prostato-membranous juncture. The stricture was divided on the floor of the urethra, a large catheter passed and then the tissues brought together by a continuous catgut suture uniting the edges of the incision, which was parallel to the long axis of the urethra. Drainage-tube and packing as in the other cases.

Time of operation: Sixty-five minutes.

Subsequent course of case: No fever. No pain. Urine came through wound for five days. Catheter withdrawn in ten days. Bladder emptied by Nélaton catheter every four hours for four days. Drainage-tube withdrawn on the fifteenth day. Wound healed solidly on the seventeenth day, patient urinating naturally in three weeks. Went home on the twenty-seventh day.

Calibre of urethra at date of discharge: Uses No. 31 steel sound easily.

In cases of extravasation of urine following rupture it has been thought that some light could be thrown by the history of the accident upon the probable situation of the injury.

Franc, Velpeau, and Poncet have attributed the urethral laceration to the crushing of the membranous portion of the urethra between the offending body and the lower border of the pubic arch. If the accident occurred with the patient in a leaning position, the body directed forward, they believe that the posterior part of the spongy urethra could be crushed against the pubis; and think that when the force that produces the injury acts in the lateral direction the urethra is more probably pressed against the upper portion of the descending pubic ramus. Ollier refers lacerations of the membranous urethra to the pressure of the canal against the sharp edges of the subpubic ligament, which in his experiments seemed to have divided the upper wall of the urethra. Terrillon believes that when the body which is fallen upon is narrow the urethra is crushed against the ramus of the pubes, and thinks the injury is likely to be found about the region of the bulb; and when the fall is upon a broader substance, the urethra is crushed against the anterior surface or inferior edge of the pubes and the lesion is found more anteriorly. Guyon says that in this accident, whether the cause is a fall or blow, the mechanism is the same; the urethra and the soft parts which immediately surround it are pressed and crushed against the resisting pubic symphysis, whilst the superficial tissues, more supple and more elastic, escape or are scarcely involved. He believes, as does Terrillon, that such ruptures are frequently only partial, and that they are commonly situated in the spongy part of the urethra, an inch or less in front of the anterior layer of the triangular ligament, and in this opinion he is supported by Iversen, who has recently analyzed twenty-nine cases of this accident. Duplay thinks that in a certain proportion of cases the urethra is ruptured by a temporary dislocation of the symphysis pubis, the soft bones springing back into their proper relation after the crushing force is removed, and leaving no trace of the accident except the urethral lesion.

He thinks that this "rupture by traction" may also occur in a case of fracture of the pelvis with a displacement of a portion of the pubic arch; and it is of course evident that the urethral wall could be wounded directly by a fragment of bone after such a fracture.

In my own experience the history of the case has been of but little value in determining the seat of laceration, which could be better estimated by the character and limitation of the extravasation.

The urethra may, for example, be divided into four regions. In all that part from the meatus to the scrotal curve extravasation is accompanied by a swelling and discoloration of the penis, greatest in the immediate neighborhood of the injury.

In the region included between the attachment of the scrotum and the anterior part of the bulb, the course of extravasated blood or urine is governed by the attachments of the deep layer of the superficial fascia, or fascia of Colles.

Extravasation of urine occurring through laceration in the bulbous region of the urethra will first follow the space enclosed by this fascia in front and below, and by the anterior layer of the triangular ligament posteriorly, and, as it cannot reach the ischio-rectal space on account of the attachment of the fascia to the base of the ligament, and cannot reach the thighs on account of the insertion of the fascia into the ischio-pubic line, it is directed into the scrotal tissues, and thence up between the pubic spine and symphysis until it reaches the abdomen.

If the injury affect the membranous urethra alone, the surrounding structures not being involved in the laceration, the extravasated urine would be confined to the region included between the layers of the triangular ligament, and would only gain access to other parts after suppuration and sloughing had given it an outlet. The consecutive symptoms would then depend upon the portion of the aponeurotic wall which first gave way.

If the injury is situated behind the posterior layer of the triangular ligament, *i. e.*, in the prostatic urethra, the urine may either follow the course of the rectum, making its appearance in the anal perineum, or, as it is only separated from the pelvis by the thin pelvic fascia, it may make its way through the latter near the pubo-prostatic ligament, where it is especially weak, and may spread rapidly through the subperitoneal connective tissue.

According to Iversen, the external swelling is usually absent, and the above occurrences are to be suspected from the severity of the symptoms.

In the presence of retention of urine from recent rupture of the urethra in which catheterism is impossible, there can be no doubt as to the proper procedure. Immediate perineal section is so obviously the only operation which meets all the indications that no other can be seriously considered.

In mild cases of rupture, *i. e.*, in those where after such an injury there is an appearance of blood at the meatus, with difficult urination, or with retention, but with no evidence of extravasation, or no general alarming symptoms, and in which catheterization is easy, the surgeon may be content with regular evacuation of the bladder by means of a soft instrument, well greased with carbolized oil, and with prescribing absolute rest, the patient being carefully watched for the onset of fever or the appearance of local swelling. In cases of a more severe type, in which, in addition to urethrorrhagia and retention of urine, there are evidences of extravasation, and in which catheterism, though difficult, is possible, it is wisest to leave a full-sized catheter in the bladder, and

at the same time freely to lay open the perineum and scrotal tissues, or any which have been involved in the extravasation.

In the cases of greater gravity, however, where no instrument can be passed into the bladder, perineal section is, as I have said, imperatively indicated. The steps of the procedure are obvious and beyond dispute except as to a few points; which I may mention *seriatim*:

1. If persevering search fails to reveal the proximal end of the torn urethra, are suprapubic cystotomy and retrograde catheterization justifiable? I am inclined to answer this affirmatively, though such failure should be most exceptional. If the bladder contains urine, and particularly if it is distended, pressure at the hypogastrium or bimanual pressure with the fingers of one hand on the abdomen and of the other in the rectum as recommended by Dr. Bangs will often cause a jet of urine to issue from the proximal end, and will at once disclose its situation. Hæmorrhage in the whole wound by very hot water will sometimes reveal the urethra by emphasizing the difference between its color and that of the surrounding parts, the urethra generally showing much paler. The relation to the pubis and to the lower edge of the triangular ligament should be most carefully borne in mind, the search for the torn end in ruptures and for the portion behind the stricture in these cases being frequently carried too near the pubes. The membranous urethra in the adult usually runs through the ligament about one inch below the symphysis and about three-quarters of an inch above the perineal centre. All guides, however, fail occasionally in certain of these cases, and it is then that supra-pubic cystotomy is warranted as an operation with so small a mortality that the slight additional risk is far outweighed by the advantage to the patient of having even an imperfect restoration of his urethral canal.

Retrograde catheterization was practised for the first time in 1757, by Verguin, a surgeon of Toulouse, who passed a catheter into the urethra through a pre-existent fistula of the bladder consecutive to supra-pubic puncture. Since which time a number of surgeons have had recourse to this procedure, and Sédillot formerly expressed the opinion, "that in the absence of a pre-existent fistula, if, in the course of an external urethrotomy, undertaken for an impassable stricture, it were found impossible to discover the posterior end, the surgeon would be justified in doing a supra-pubic cystotomy at once, in order to practise retrograde catheterization."¹

2. Although some differences of opinion exist as to the value of a retained catheter after most perineal operations opening the urinary tract, there can be no question of its value in cases of rupture, and I believe that

¹ Duplay: "Injuries and Diseases of the Urethra," International Encyclopædia of Surgery.

it is of great use in *all* forms of perineal operation opening any portion of the urinary tract. If Spence's caution is observed, and it is not allowed to project too far into the bladder, if it is kept clean and sweet by regular antiseptic injections, it is of the utmost advantage in aiding in the prevention of urethral fever, as has been shown by Keyes, Harrison, Diday, Shield, Hill, and many others.

3. After the introduction of the catheter in cases of rupture, is there definite advantage to be derived from urethral sutures?

The surgeon has four plans open to him: *a*, To leave the wound open without any attempt at coaptation; *b*, to suture the urethra only; *c*, to suture only the perineum; *d*, to suture the urethra at one place and the perineum at another.

The experiences of Guyon, Championnière, Le Dentu, Molière (de Lyon), Erasme, Kaufmann, of Zurich, Tenier, C. H. Mastin, Marmaduke Shield, and myself would seem to justify the employment of sutures of the urethra. By the introduction and retention of a large catheter, and the careful coaptation of the torn ends, we meet all the indications, which are:

1st. To open a large passage for the accumulating fluids; 2d, to keep up a free flow of urine; 3d, to encourage rapid union of the two ends of the urethra and the walls of the cavity formed by the extravasation into the perineum; 4th, to prevent the formation of a cicatricial stricture of the urethra.

My results by these methods have thus far been so extremely satisfactory that I shall certainly continue their employment.

4. The sterilization of the urine by boric acid, as recommended by Palmer and others, or by salol following the method of Dreyfous and Lane, is of great importance in the after-treatment of all these cases, and should never be omitted. These remedies will be more effective in my judgment if combined with full doses of quinine.

In all cases in which perineal section is performed for impassable stricture, without other complications, the method of Mr. Wheelhouse, of Leeds, seems to me to meet every indication. The passage of the staff to the stricture shows the exact site of the latter; the insertion of the threads into the divided urethra, serves not only to hold it open and give an opportunity for the discovery of the proximal portion, but also seems to fix the anterior end, and render it easily recognizable during the operation. The least useful direction which Mr. Wheelhouse gives is that of turning the staff with the concavity of the curve upward, so as to hook it into the upper portion of the urethral wound. The instrument is sometimes in the way, has to be held by an assistant, and it seems to me does not afford much help during the operation.

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